IN THE CLAIMS

Please cancel without prejudice claims 4, and 17-20.

Please amend claims 1, 5-6, 8, 10, and 16 as indicated below.

1. (Currently Amended) A system, comprising:

a rotating shaft having shaft movement parameters;

an incremental shaft encoder coupled to the rotating shaft to convert the shaft movement parameters of the rotating shaft into differentially encoded electrical signals suitable for processing;

an electrical-to-optical (E/O) converter coupled to the incremental shaft encoder to convert the differentially encoded electrical signals into optical signals;

a plurality of optical conductors to carry the optical signals; and

an optical-to-electrical (O/E) converter to receive the optical signals from the optical conductors and convert the optical signals back into electrical signals, wherein the E/O converter includes:

a differential-to-single converter to convert the differential encoded electrical signals to single-ended electrical signals; and

a transient over-voltage protection circuit coupled to the differential-to-single converter, wherein the transient over-voltage protection circuit provides over voltage protection of the differentially encoded electrical signals for the differential-to-single converter.

2. (Original) The system of claim 1, wherein said plurality of optical conductors includes fiber optic cables.

3. (Previously Presented) The system of claim 1, further comprising:

a shaft coupler configured to couple the rotating shaft to the incremental shaft encoder.

4. (Canceled)

5. (Currently Amended) The system of claim [[4]] 1, wherein the transient over-voltage protection circuit comprises:

a voltage level regulator coupled to the transient over-voltage protection circuit to regulate the differentially encoded electrical signals to a voltage level required by the differential-to-single converter;

a single pole filter coupled to the voltage level regulator to filter noise from the differentially encoded electrical signals; and

a current limiting circuit coupled to the voltage level regulator to limit an electrical current of the differentially encoded electrical signals.

6. (Currently Amended) The system of claim [[4]] 1, wherein the E/O converter further includes a single-ended encoder coupled to the differential-to-single converter to convert the single-ended electrical signals received from the differential-to-single converter to the optical signals to be transmitted to the optical conductors.

7. (Previously Presented) The system of claim 6, wherein the single-ended encoder includes:

a plurality of optical couplers to couple the single-ended electrical signals to the optical conductors for transmission; and

a plurality of driver circuit coupled to the optical couplers respectively for each of the single-ended electrical signals, each of the driver circuit including a transistor having a base, an emitter, and a collector,

wherein the base of the transistor receives the respective single-ended electrical signal and the emitter and the collector of the transistor are coupled to the respective optical coupler to drive the optical coupler.

8. (Currently Amended) ~~The system of claim 1,~~ A system, comprising:

a rotating shaft having shaft movement parameters;

an incremental shaft encoder coupled to the rotating shaft to convert the shaft movement parameters of the rotating shaft into differentially encoded electrical signals suitable for processing;

an electrical-to-optical (E/O) converter coupled to the incremental shaft encoder to convert the differentially encoded electrical signals into optical signals;

a plurality of optical conductors to carry the optical signals; and

an optical-to-electrical (O/E) converter to receive the optical signals from the optical conductors and convert the optical signals back into electrical signals,

wherein the O/E converter includes:

a plurality of optical couplers to receive the optical signals from the optical conductors, and to convert the optical signals to single-ended electrical signals; and

a single-to-differential converter coupled to the optical couplers to convert the single-ended electrical signals to differentially encoded electrical signals.

9. (Previously Presented) The system of claim 8, wherein the O/E converter further includes a transient over-voltage protection circuit coupled to the single-to-differential converter to provided over voltage protection for the differentially encoded electrical signals.

10. (Currently Amended) A method, comprising:

receiving differentially encoded shaft encoder signals representing one or more shaft movement parameters of a rotating shaft;

converting via an electrical-to-optical (E/O) converter the differentially encoded shaft encoder signals into single-ended electrical signals;

converting the single-ended electrical signals into optical signals using the E/O converter, the E/O convert including

a differential-to-single converter to convert the differentially encoded shaft encoder signals into the single-ended electrical signals, and

a transient over-voltage protection circuit coupled to the differential-to-single converter, wherein the transient over-voltage protection circuit provides over voltage protection of the differentially encoded electrical signals for the differential-to-single converter; and

transmitting the optical signals through optical conductors.

11. (Original) The method of claim 10, further comprising:

coupling shaft movement parameters of a rotating shaft.

12. (Original) The method of claim 11, further comprising:

converting the coupled parameters into electrical signals.

13. (Original) The method of claim 12, further comprising:

differentially encoding the electrical signals.

14. (Original) The method of claim 10, further comprising:

receiving the optical signals from the optical conductors.

15. (Original) The method of claim 14, further comprising:

converting the optical signals into single-ended electrical signals.

16. (Currently Amended) The method of claim 15, further comprising:

differentially encoding the single-ended electrical signals, wherein the receiving, converting, and differentially encoding are performed by an optical-to-electrical (O/E) converter, the O/E converter including

a plurality of optical couplers to receive the optical signals from the optical conductors, and to convert the optical signals to single-ended electrical signals; and

a single-to-differential converter coupled to the optical couplers to convert the single-ended electrical signals to differentially encoded electrical signals.

17. – 20. (Canceled)